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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/521,210	03/08/2000	Hiroshi Tanaka	862.C1856	1390

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EXAMINER

CHAWAN, SHEELA C

ART UNIT PAPER NUMBER

2625

DATE MAILED: 02/05/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/521,210

Applicant(s)

TANAKA, HIROSHI

Examiner

Sheela C Chawan

Art Unit

2625

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 December 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 37-49 and 61-71 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 37-49 and 61-71 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. Applicant's amendment filed Dec 10, 2003 (paper # 7/B) have been entered .
2. Applicant's argument with respect to claims 37-49 and 61-71 have been considered but are moot in view of the new ground (s) of rejection, as necessitated by applicant's amendment.

Claim Rejections - 35 U.S.C. § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103[©] and potential 35 U.S.C. 102(f) or (g) prior art under 35 U.S.C. 103(a).

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior

art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 37- 49, and 61-71, are rejected under 35 U.S.C. 103(a) as being unpatentable over Kosugi et al. (US.4,814,829) in view of Cognex Corporation User's Manual (Cognex 4000/5000 SMD Placement Guidance Package; Fuducial finder 5).

As per claims 37 and 49, Kosugi discloses a position detection apparatus for detecting a position of a mark on an object (abstract), said apparatus comprising:

a camera which captures an image of the mark (column 22, lines 31- 35);
an extraction section which extracts an edge position of the mark based on a signal derived from the image of the mark (column 39, lines 45- 68, column 40, lines 5-26), the edge position being extracted with respect to each combination of a direction and a polarity of the signal (fig 32, column 35, lines 45- 55); and

Kosugi discloses a projection exposure apparatus having an optical system for detecting image information concerning an object having a surface transparent film. Kosugi is silent about specifics details of comparing the edge position, with respect to each combination, with a corresponding template prepared with respect to each combination.

Cognex Corporation User's Manual (Cognex 4000/5000 SMD Placement Guidance Package ; Fuducial finder 5). The system comprises of :

a determination section which determines a position of the mark (page 182, page 184, Training a model) by comparing each of the plurality of extracted edge positions with a corresponding one of templates prepared for the respective combinations (Pages 191, 200- 203, 208, 210). Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to have modified Kosugi to include comparing each of the plurality of extracted edge positions with a corresponding one of templates . It would have been obvious to one of ordinary skill in the art at the time of the invention to have modified Kosugi by the teaching of Cognex Corporation User's Manual in order to determine the position and quality of a fiducial mark in an acquired image of an object and to accomplish this the search operation measures the extent to which a feature matches a previously trained model of that feature as suggested by Cognex Corporation User's Manual (page 209, searching for a fiducial mark).

As per claim 38, Cognex Corporation User's Manual discloses an apparatus further comprising a control section which changes a parameter used by at least one of said extraction section , and said determination section based on a result of the comparing by said determination section (pages 215 - 220, evaluating features based on specified parameters , page 222 talks about program creating /training a rectangle fiducial model) .

As per claims 39 and 62, Cognex Corporation User's Manual discloses an apparatus wherein the parameter changed by said control section is stored in a memory and used as a base for processing to be executed later (pages 215 - 220, evaluating

features based on specified parameters, page 222 talks about program creating /training a rectangle fiducial model).

As per claims 40 and 63, Cognex Corporation User's Manual discloses an apparatus wherein said determination section performs the comparing by evaluating a degree of matching between edge positions and the templates (page 202, pages 215 - 220, evaluating features based on specified parameters , page 222 talks about program creating /training a rectangle fiducial model) .

As per claims 41 and 64, Cognex Corporation User's Manual discloses an apparatus wherein said determination section determines the position of the mark as a center position (page 185 , specifying the expected size of a fiducial) of the template based on the degree of matching (Pages 191, 200- 203, 208, 210) .

As per claims 42 and 65, Cognex Corporation User's Manual discloses an apparatus wherein said determination section performs the comparing using a correlation method (page 212) .

As per claims 43 and 66, Kosugi discloses an apparatus wherein said extraction section obtains the signal by differentiating a signal of the image (column 35, lines 45- 55, fig 32) .

As per claim 44, Kosugi discloses an apparatus wherein the polarity is a sign of the differential signal (column 35, lines 46- 55, fig 32) .

As per claims 45 and 67 Kosugi discloses an apparatus wherein said extraction section obtains the signal along each of at least two directions in the image (fig 32, column 40, lines 35- 68) .

As per claims 46 and 68, Cognex Corporation User's Manual discloses an apparatus wherein the template, with respect to each combination (page 207) includes a plurality of positions of interest, Pages 191, 200- 203, 208, 210).

As per claims 47 and 69, Cognex Corporation User's Manual discloses an apparatus wherein a parameter used for at least one of a noise removal processing for the image and a correction of the edge position is changed based on a result of the comparing by said determination section (page 191, page 213 normalized correlation) .

As per claims 48 and 70, Kosugi discloses an apparatus wherein said camera captures the image under a dark field illumination (column 22 , lines 23- 35).

As per claims 61 and 71, Kosugi discloses a position detection apparatus for detecting a position of a mark on an object (abstract), said apparatus comprising:

- a camera which captures an image of the mark (column 22, lines 31-35) ;

- an extraction section which extracts an edge position (column 21, lines 42- 52) of the mark based on the image of the mark (fig 32, column 35, lines 45- 55, column 39, lines 45- 68, column 40, lines 5- 26) ;

- a control section that changes a parameter used by at least one of said extraction section and said determination section (column 1, lines 18- 31, 50- 56), based on a result of the comparing by said determination section (column 11, lines 5- 14, column 27, lines 18- 26) .

Kosugi is silent about specifics details of determines a position of the mark by comparing the edge position with a template.

Cognex Corporation User's Manual (Cognex 4000/5000 SMD Placement Guidance Package ; Fuducial finder 5). The system comprises of :

a determination section which determines a position of the mark (page 182, page 184, Training a model) by comparing the edge position with a template (Pages 191, 200- 203, 208, 210). Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to have modified Kosugi to include a position of the mark by comparing the edge position with a template. It would have been obvious to one of ordinary skill in the art at the time of the invention to have modified Kosugi by the teaching of Cognex Corporation User's Manual in order to determine the position and quality of a fiducial mark in an acquired image of an object and to accomplish this the search operation measures the extent to which a feature matches a previously trained model of that feature as suggested by Cognex Corporation User's Manual (page 209, searching for a fiducial mark).

4. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event will the statutory period for reply expire later than SIX MONTHS from the date of this final action.


Contact Information

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sheela C Chawan whose telephone number is 703-305- 4876. The examiner can normally be reached on Monday through Thursday 7.30 a.m. to 6.00 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bhavesh Mehta, can be reached on (703) 308 - 5246. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-3800.

SCC
Sheela Chawan
Patent Examiner
Group Art Unit 2625
Jan 30, 2004


BHAVESH M. MEHTA
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